

REMARKS

The Applicants respectfully request reconsideration and allowance of claims 1-20 in view of the following arguments and the amendments presented above.

INTERVIEW SUMMARY

The Applicants appreciate the telephone interview conducted October 5, 2004, between Examiner Connolly and the undersigned attorney. In the interview, the undersigned attorney summarized the arguments presented below, in particular, emphasizing the fundamental distinctions between the Buller patent and Applicants' claims. In particular, the power transitioning arrangement set out in Applicants' claims was discussed in detail and the differences between Applicants' claims and Buller were clarified. It was agreed that the Applicants would submit clarifying amendments to the independent claims along the lines set out above. No agreement was reached as to the allowability of the claims.

STATUS OF THE CLAIMS

The present application was filed with claims 1-20. Independent claims 1, 10, and 17 are amended above to clarify the nature of reducing the rate of temperature change in a processing device according to the present invention. In particular, claims 1, 10, and 17 are amended to include further language defining the referenced "transitioning" of power dissipation. Since the meaning of the expression "gradually transitioning" now set out in the claims is apparent from the disclosure in the present application, the Applicants believe that these amendments are not

1 further limiting, but merely clarify the intended scope of the claims. Claim 20 is amended above
2 to address an informality. The amendment to claim 20 does not change the scope of the claim.
3 Claims 1-20 remain pending in this application.
4

5 **CLAIMS 1, 6-8, 10, 14, 15, AND 17 ARE NOT ANTICIPATED BY THE CITED PRIOR ART**

6 The Examiner rejected claims 1, 6-8, 10, 14, 15, and 17 under 35 U.S.C. § 102(b) as
7 being anticipated by Buller et al. (U.S. Patent No. 5,737,171, hereinafter referred to as "Buller").
8 The Applicants respectfully submit that the claims are not anticipated by this reference on the
9 ground that the Buller patent does not teach each element required in the respective claims.
10

11 **The Buller Patent**

12 The Buller patent is directed to a system for switching thermal impedance levels of an
13 integrated circuit package in response to power management signals. In particular, Buller
14 discloses energizing a fan when the integrated circuit package operates in a high power mode and
15 disabling the fan when the integrated circuit package operates in a low power mode.
16

17 **The Buller Patent Fails to Teach Each Element Required in the Respective Claims**

18 Element (a) of Applicants' claim 1 requires an arrangement for gradually transitioning
19 power dissipation in the processing device between a low power dissipation level and a high
20 power dissipation level in response to a change in a power state signal. Element (c) of
21 Applicants' claim 1 requires,

1 "a cooling system controller for placing the cooling system at the high thermal
2 impedance in conjunction with a gradual transitioning from the high power
3 dissipation level to the low power dissipation level, and for placing the cooling
4 system at the low thermal impedance in conjunction with a gradual transitioning
5 from the low power dissipation level to the high power dissipation level."

6 Applicants' claim 10 requires similar apparatus limitations and Applicants' claim 17 requires
7 similar limitations in method form.

8 In contrast, Buller discloses merely switching a fan based on whether the processing
9 system is in a high power mode or low power mode. There is no teaching or suggestion in Buller
10 to gradually transition from one power dissipation level to another and certainly no teaching or
11 suggestion to coordinate fan operation with gradual power transitioning.

12 It is noted that Applicants' recited "transitioning" of power levels includes more than
13 switching between two power dissipation levels. As defined in Applicants' specification at page
14 4, lines 13-20, the recited transitioning is a gradual transition between power states that is made
15 possible in some forms of the invention with a frequency divider that provides step changes in
16 frequency levels. The difference made by the gradual transitioning is reflected in the graph of
17 Figure 4 of Applicants' application and described in the application at page 13, lines 11-13.

18 Regardless of the clear transitioning definition in Applicants' specification, Applicants
19 have amended the claims to further clarify this difference from the arrangement disclosed in
20 Buller. For example, element (a) of Applicants' independent claim 1 as amended above requires
21 "gradually transitioning power dissipation."

22 Because Buller fails to disclose an arrangement for gradually transitioning between power
23 levels and also does not disclose cooling system controller for coordinating fan operation with
24 power level transitioning as required by Applicants' claims, Applicants respectfully submit that

claims 1, 10, and 17 are not anticipated by Buller and are entitled to allowance together with their respective dependent claims.

CLAIMS 2, 11, AND 18 ARE NOT OBVIOUS OVER THE CITED PRIOR ART

The Examiner rejected claims 2, 11, and 18 under 35 U.S.C. § 103(a) as being unpatentable over Buller as applied to claims 1, 6-8, 10, 14, 15, and 17 above, and further in view of Thomas et al. (U.S. Patent No. 5,752,011, hereinafter referred to as "Thomas"). The Applicants respectfully traverse these rejections on the ground that the proposed combination does not teach or suggest each and every limitation set forth in the claims and on the ground that there is no teaching, suggestion, or motivation in the prior art to make the combination proposed by the Examiner.

Thomas was cited to show that it was known to delay changes in clock frequency until after changes have been made to thermal impedance (see OA, pg. 5, para 13). In particular, the Examiner noted that

"Thomas teaches that a change in the thermal impedance should occur before a transition in the power state. Doing this would allow a high power mode to be sustained for a longer period of time thus inherently delaying a reduction in frequency due to high temperature" (OA, pg. 5, para 13)

As discussed in the present application, the goal of the present invention is to minimize the rate of temperature fluctuation in the integrated circuit package due to changes in operational state. As discussed at page 12 of the present disclosure, the delay referenced in claims 2, 11, and 18 is to account for the time that it takes for the fan to go from off to operating speed and from operating speed to off. However, the delay taught by Thomas and referenced by the Examiner in

1 the Office Action is intended to turn the fan on to reduce the temperature of the integrated circuit
2 package further before switching to a high power dissipation state which would actually increase
3 the overall temperature variation in the integrated circuit package. Thus, the cited teaching from
4 Thomas is contrary to the goal of the present invention. That is, Thomas actually teaches away
5 from the present invention.

6 As discussed above, the present claims require both an arrangement for gradually
7 transitioning power dissipation, and an arrangement for changing thermal impedance in
8 conjunction with this gradual transitioning of power dissipation. As with Buller, Thomas does
9 not teach or suggest the gradual transitioning of power dissipation levels as required by
10 Applicants' independent claims. Because neither Buller nor Thomas teach or suggest the gradual
11 transitioning of power dissipation levels required in Applicants' claims or the coordination of
12 thermal impedance in conjunction with power level transitioning, the proposed combination of
13 Buller and Thomas fails to include each and every limitation set out in the present claims.
14 Therefore, the Applicants respectfully submit that the present claims are not obvious in view of
15 the proposed combination of Buller and Thomas.

16 Further, in order to combine elements from different prior art references under 35 U.S.C.
17 §103(a), there must be some teaching, suggestion, or motivation in the prior art to make the
18 combination. The showing of a suggestion, teaching, or motivation to combine prior teachings
19 "must be clear and particular Broad conclusory statements regarding the teaching of
20 multiple references, standing alone, are not 'evidence'." *In re Dembiczak*, 175 F.3d 994, 50
21 USPQ2d 1614 (Fed. Cir. 1999). No such suggestion exists for combining the Buller and Thomas
22 references, and in fact, Thomas teaches away from the present invention by suggesting that the

1 overall temperature fluctuation in an integrated circuit package should be increased. Absent the
2 required teaching, suggestion, or motivation in the prior art to combine Buller and Thomas as the
3 Examiner suggests, the rejection of dependent claims 2, 11, and 18 under § 103 is improper and
4 should be withdrawn for this reason alone.

5 For all of these reasons the Applicants respectfully submit that claims 2, 11, and 18 are
6 not obvious in view of the Thomas and Buller patents, and are entitled to allowance together with
7 the other claims in the case.

8
9 CLAIMS 4, 9, 12, AND 16 ARE NOT OBVIOUS OVER THE CITED PRIOR ART

10 The Examiner rejected claims 4, 9, 12, and 16 under 35 U.S.C. § 103(a) as being
11 unpatentable over Buller as applied to claims 1, 6-8, 10, 14, 15, and 17 above, and further in
12 view of Kim (U.S. Patent No. 6,009,005, hereinafter referred to as "Kim"). The Applicants
13 respectfully traverse these rejections on the ground that the proposed combination does not teach
14 or suggest each and every limitation set forth in the claims and on the ground that there is no
15 teaching, suggestion, or motivation in the prior art to make the combination proposed by the
16 Examiner.

17 Kim was cited to show that it was known to use a frequency divider bypass. However,
18 claims 4, 9, 12, and 16 do not merely require a frequency divider and divider bypass. As
19 discussed in detail above, the present claims require a controller for controlling the system
20 thermal impedance in conjunction with a gradual transitioning in power dissipation levels.
21 Because neither Buller nor Kim teach or suggest this thermal impedance control in conjunction
22 with power level gradual transitioning, the proposed combination of references cannot teach or

1 suggest all of the elements required in the present claims, and cannot render the present claims
2 obvious under 35 U.S.C. §103.

3 Further, the Office Action offers no support at all for the combination of Buller and Kim.
4 Absent any teaching, suggestion, or motivation to combine Buller and Kim as proposed by the
5 Examiner, the combination is improper under 35 U.S. C. §103 and should be withdrawn.

6 For all of these reasons, that Applicants submit that claims 4, 9, 12, and 16 are not
7 obvious over the proposed combination of Buller and Kim and are entitled to allowance together
8 with the other claims in the case.

9
10 CLAIMS 3, 5, AND 13 ARE NOT OBVIOUS OVER THE CITED PRIOR ART

11 The Examiner rejected claims 3, 5, and 13 under 35 U.S.C. § 103(a) as being
12 unpatentable over Buller as applied to claims 1, 6-8, 10, 14, 15, and 17 above, and further in
13 view of Bailey et al. (U.S. Patent No. 6,654,898, hereinafter referred to as "Bailey"). The
14 Applicants respectfully traverse these rejections on the ground that the proposed combination
15 does not teach each and every limitation set forth in the claims and on the ground that there is no
16 teaching, suggestion, or motivation in the prior art to make the combination proposed by the
17 Examiner.

18 Bailey was cited to show that it was known that communication within a host system
19 occurs when different ICs within the host system operate using different clocks. However,
20 claims 3, 5, and 13 do not merely require that the processing system include elements operating
21 at different clock rates. Rather, these claims also require a controller for controlling the system
22 thermal impedance in conjunction with a gradual transitioning in power dissipation levels.

1 Because neither Buller nor Bailey teach or suggest this thermal impedance control in conjunction
2 with power level gradual transitioning, the proposed combination of references cannot teach or
3 suggest all of the elements required in the present claims, and cannot render the present claims
4 obvious under 35 U.S.C. §103.

5 Further, the Office Action does not support the combination of Buller and Bailey. The
6 prior art must fairly teach or suggest the specific combination as claimed, yet there is no
7 teaching, suggestion, or motivation in the record to combine Buller and Bailey to produce the
8 cooling system controller required in claims 3, 5, and 13.

9 For all of these reasons, that Applicants submit that claims 3, 5, and 13 are not obvious
10 over the proposed combination of Buller and Bailey and are entitled to allowance together with
11 the other claims in the case.

12
13 CLAIM 19 IS NOT OBVIOUS OVER THE CITED PRIOR ART

14 The Examiner rejected claim 19 under 35 U.S.C. § 103(a) as being unpatentable over
15 Buller as applied to claims 1, 6-8, 10, 14, 15, and 17 above, and further in view of Ganfield et al.
16 (U.S. Patent No. 5,815,694, hereinafter referred to as "Ganfield"). The Applicants respectfully
17 traverse these rejections on the ground that the proposed combination does not teach or suggest
18 each and every limitation set forth in the claims and on the ground that there is no teaching,
19 suggestion, or motivation in the prior art to make the combination proposed by the Examiner.

20 Ganfield was cited to show that a clock must be transitioned gradually in order to avert
21 adverse consequences (see OA, pg. 7, para. 23). However, claim 19 does not merely require the
22 step of gradually transitioning a system clock. Rather, claim 19, through its dependency on claim

1 17 requires the step of placing a cooling system for a processing device at a high thermal
2 impedance in conjunction with a gradual transitioning from a high power dissipation level to a
3 low power dissipation level, and placing the cooling system at a low thermal impedance in
4 conjunction with a gradual transitioning from the low power dissipation level to the high power
5 dissipation level. Even if Buller and Ganfield are combined as proposed by the Examiner, the
6 resulting combination fails to teach or even suggest this thermal impedance control step.

7 Further, there is no proper teaching, suggestion, or motivation in the prior art to combine
8 Ganfield with Buller. In an attempt to support the combination of Ganfield and Buller, the
9 Examiner indicates at page 7, paragraph 23 of the Office Action that "*it would be obvious* to
10 transition the clock in the Buller system gradually in order to avoid any adverse consequences
11 associated with adjusting a clock frequency." (Emphasis added) However, the issue under 35
12 U.S.C. §103 is not what would be obvious now. Rather, the proper test for combining references
13 under §103 is what would have been obvious to one of ordinary skill in the art at the time of the
14 invention. Applicants respectfully submit that there is nothing in prior art of record in the case
15 that would teach or suggest combining Buller and Ganfield to result in the step of controlling
16 thermal impedance in conjunction with gradual power level transitioning. Absent a proper
17 teaching, suggestion, or motivation in the prior art to make the proposed combination of Buller
18 and Ganfield, the §103 rejection of claim 19 is improper and should be withdrawn for this reason
19 alone.

20 For all of these reasons, that Applicants submit that claim 19 is not obvious over the
21 proposed combination of Buller and Ganfield and is entitled to allowance together with the other
22 claims in the case.

1 CLAIM 20 IS NOT OBVIOUS OVER THE CITED PRIOR ART

2 The Examiner rejected claim 20 under 35 U.S.C. § 103(a) as being unpatentable over
3 Buller as applied to claims 1, 6-8, 10, 14, 15, and 17 above, and further in view of Lee et al.
4 (U.S. Patent No. 5,414,863, hereinafter referred to as "Lee"). The Applicants respectfully
5 traverse these rejections on the ground that the proposed combination does not teach or suggest
6 each and every limitation set forth in the claims and on the ground that there is no teaching,
7 suggestion, or motivation in the prior art to make the combination proposed by the Examiner.

8 Lee was cited to show that different portions of the system should be powered up or down
9 in different stages to minimize power usage and to avoid power surges and damage to
10 components due to incorrect biasing. Again, however, neither Lee nor Buller suggests modifying
11 either system to place an associated cooling system at a high thermal impedance in conjunction
12 with a gradual transitioning from a high power dissipation level to a low power dissipation level,
13 and to place the cooling system at a low thermal impedance in conjunction with a gradual
14 transitioning from the low power dissipation level to the high power dissipation level. Thus,
15 even if Buller and Lee are combined as proposed by the Examiner, the resulting combination
16 fails to teach or even suggest this thermal impedance control step.

17 In support of the combination of Lee with Buller, the Examiner indicates at page 8,
18 paragraph 25 of the Office Action that it would have been obvious to "modify the power
19 dissipation of the different processing elements" in the Buller system in order to minimize power
20 surges and damage to components due to incorrect biasing and power usage as taught by Lee.
21 However, this rationale for the obviousness of combining Buller and Lee still does not address
22 the specific type of combination required to meet the limitations of claim 20. That is, merely

1 citing a rationale to combine references does not provide a rationale for making the specific
2 combination required to meet the limitations of the claim in question. In this case, the Office
3 Action fails to cite any teaching, suggestion, or motivation to combine the teachings of Buller
4 and Lee to perform the step of controlling thermal impedance in conjunction with gradual power
5 level transitioning.

6 For all of these reasons, the Applicants submit that claim 20 is not obvious over the
7 proposed combination of Buller and Lee, and is entitled to allowance together with the other
8 claims in the case.

1 CONCLUSION

2 For all of the above reasons, the Applicants respectfully request reconsideration and
3 allowance of claims 1-20.

4 If any issue remains as to the allowability of these claims, or if a conference might
5 expedite allowance of the claims, the Examiner is asked to telephone the undersigned attorney
6 prior to issuing a further action in this case.

7
8 Respectfully submitted,

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20 CERTIFICATE OF FACSIMILE

21 I hereby certify that this correspondence is being facsimile transmitted to the United States Patent and Trademark Office, (Fax
22 No. 703-872-9306) on October 27, 2004.

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